



Perspective-taking and hindsight bias: When the target is oneself and/or a peer

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Abstract

President Trump reacted to a reporter's query about the coronavirus outbreak by stating that the reporter was a "lousy journalist", underscoring the importance of perspective-taking in social exchanges. Egocentrism is the belief that others share the same perspective as your own and hampers the perspective-taking of another naive person. An issue is whether it is seen in hindsight bias where we overestimate what we knew beforehand. Via a foreseeability-inevitability platform, participants were randomly assigned to make self-judgments for problem-solving from a foresight (no answers) or three hindsight (answers) conditions. In two hindsight conditions, participants were asked to ignore or not to ignore the answers. In the last condition, participants predicted for an unfamiliar peer asked to ignore the answers. Next, all participants made judgments again from the perspective of the peer. Predominately in hindsight, participants showed significant changes responding but with an appropriate baseline comparison showed essentially the same hindsight bias in judgments for themselves and the peer. Ignoring or not ignoring the answers produced the same outcome. This sharing of perspective-taking dovetails with individuals' believing their hindsight knowledge is commonly present among others. Although participants in hindsight believed their foreseeable predictions for the peer were more accurate or realistic, it was more challenging to predict for the peer than themselves. Implications for individuals' judgments about Donald Trump's decision-making for COVID-19 are discussed. Researchers should examine perspective-taking in hindsight bias as everyday social interaction involves reasoning about others.

Keywords Hindsight bias · Perspective-taking · Egocentrism · Foreseeability-inevitability · Problem-solving

Introduction

During the White House's daily coronavirus task force briefing on March 15, 2020, the NBC News reporter Peter Alexander cited the latest pandemic statistics and asked President Trump, "What do you say to Americans who are scared?" at the end of the exchange. The President replied, "...you are a terrible reporter!" and continued his rant by saying the question was "nasty" and that Alexander was doing "sensationalism" like NBC and Comcast, which he later referred to as "Con-Cast" (Darcy, 2020).

Afterward, many critics were appalled that the President did not address Americans' fear for COVID-19 and failure to respond to others' misfortune. This exchange

between the President and Alexander highlighted the importance of perspective-taking, which is fundamental for social interaction. Perspective-taking can be critical in predicting and interpreting human behavior; it determines how we evaluate and describe others, as displayed in the exchange between the President and Alexander. Would the exchange have turned out differently if either of them was considerate of each other? Would perspective-taking have enhanced their ability to understand each other's point of view?

Perspective-taking can function as a "curse." Once we acquire knowledge, it hampers our judgment about what we knew beforehand or to adopt another person's naive perspective because the knowledge seems so obvious to us (Birch et al., 2017; Pezzo, 2011). This effect is readily seen in hindsight bias research related to outcome knowledge. The hindsight bias functions to influence our judgments about what we or others could have, should have, or knew about an outcome or before the outcome was known.

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Hindsight Bias

Hindsight bias has garnered broad research interest such that in 2012, there were already over 800 scholarly works on the topic (Roese & Vohs, 2012). Not only is it basic and universal (Ghrear et al., 2019; Pohl et al., 2002), there exist developmental differences (Bernstein et al., 2011; Groß & Pachur, 2019). This bias has been documented in diverse domains such as terrorist attacks (Fischhoff et al., 2005), medical judgments (Arkes et al., 1988), athletic competitions (Roese & Maniar, 1997), legal profession for negligence and medical malpractice decisions (Giroux et al., 2016; Harley, 2007), problem-solving (Hoch & Loewenstein, 1989), and in judges and experts (Giroux et al., 2016; Wilson et al., 2020). Lately, researchers have examined the effect in evaluating the decisions of others like company directors (Strohmaier et al., 2021), gamer competition (Danz, 2020), pilots (Walmsley and Gilbey (2019), abduction (McDermott et al., 2020), financial forecasting (Chuan et al., 2019), rape victims (Felson and Palmore (2018) and cheaters (Stanley et al., 2021). Hindsight bias is seen in the mass media in Wikipedia articles (Oeberst et al., 2018) and exhibited in the way you write (Meuer et al., 2021). The phenomenon is robust and so prevalent that many investigators (e.g., Harley et al., 2004) believe that it is present in “all modalities” as shown in forms like taste (Pohl et al., 2003), faces (Bernstein & Harley, 2007) and pitch variation (Bernstein et al., 2012; Higham et al., 2017).

Typically, this bias effect is examined via the hypothetical or memory design. In the former, the difference is between different groups of individuals, one in hindsight (non-naïve) and the other in foresight (naïve). In the memory design, the judgments are made by the same individuals in foresight (naïve) and then after learning the outcome (non-naïve). In both instances, individuals in hindsight overestimate their ability to predict the outcome knowledge from the foresight perspective.

Illustrative Research on Perspective-Taking and Hindsight Bias

Central to the issue of perspective-taking is the notion of egocentrism. It is the belief that others share one’s own perspective (e.g., Epley et al., 2004; Nickerson, 1999). People tend to believe their behavior, knowledge, and beliefs are commonly shared (Mullen, 1983), readily accessible, and make an automatic inference about others (Epley et al., 2004). Also, this self-reliance is evidenced in the projection bias (Krueger & Clement, 1997) and the false consensus effect (Ross et al., 1977).

Perspective-taking in hindsight bias often follow semantic and perceptual domains. Regarding the former, Fischhoff

(1975) revealed the effect using a series of independent experiments involving scenarios for a nineteenth-century battle or clinical cases. Inspired by his work, much hindsight bias research has employed case studies. In his research, participants overestimated the probability of the correct outcomes for themselves or their peers even when trying to ignore the correct outcomes in hindsight compared to foresight as they made their predictions. The implication is that people imagine their peers are much like themselves to reach the same conclusion. However, it is impossible to verify this inference because his participants did not make self or other predictions in the same experiment.

From the perceptual field is the use of faces (e.g., Harley et al., 2004), where the focus is on when participants can discriminate multiple distorted stimuli (e.g., celebrity faces). Initially, participants were presented with distorted stimulus ranging from a blurry to clear progression and asked to identify the stimulus. After identifying the stimulus, they were asked to repeat the blurry to the clear progression of the stimulus and indicate when they recognized the stimulus.

Participants showed hindsight bias by recognizing the stimulus at greater distortion in the second phase compared to the first phase of testing. This effect occurred when employing self-judgments for both testing phases or an initial self and then peer judgment. More evidence of shared perspective taking is seen in the auditory work of Bernstein et al. (2012). Employing the self-other procedure, participants in hindsight who clearly heard the targeted words or sentences misjudged naïve others’ ability to discriminate these stimuli when presented in degraded states. Because the self-self judgments or self-peer judgments occurred in different experiments (Harley et al., 2004) or the absence of an appropriate baseline comparison for the multiple judgments in a self-other comparison (Bernstein et al., 2012), it is not possible to reveal a self-peer distinction as to whether the degree of bias is the same or different for the self-peer comparison.

In a rare investigation of the self-peer distinction, Son et al. (2021) presented distorted pictures of objects and animals modeled after the work of Harley et al. (2004) to examine whether egocentrism could be altered to debias hindsight bias. In experiment 1, participants made self-self or self-peer judgments that resulted in the same outcome that supports the presence of egocentrism. In both instances, participants identified the stimuli at the same point of greater distortion when switched to the peer perspective or tested again from the self-perspective.

Regardless of the focus on the self or peer perspective, the expression of hindsight was the same. For experiment 2, participants made self-self judgments and then for 3rd and 5th graders. Again, hindsight bias was demonstrated by the participants in the self-self judgments portion of the study. Unlike experiment 1, perspective-taking for the younger

targets showed a reverse effect. Participants thought the 3rd graders would take longer to recognize the objects with the same tendency for the 5th graders than themselves. While the authors focused on the debiasing of hindsight bias, their findings also suggest that egocentrism can be present or altered by the attributes of the targeted perspective-taker.

Not only do individuals believe that their perspective-taking is shared with others as reflected in the commonality of hindsight knowledge (Bernstein et al., 2018; Birch et al., 2017; Higham et al., 2017; Hoch & Loewenstein, 1989; Wood, 1978); they can overestimate it. Demonstrating the salience and influence of correct answers, Birch et al. (2017) found participants who knew the correct answers overestimated the percentage of peers naïve to the answers who would answer correctly. The difficulty with this research on shared perspective taking and commonality of outcome knowledge is that participants made singular judgments directed at others or consecutive judgments for self and then others. In either instance, it does not clearly reveal a self-other distinction showing the contribution of one's own judgment in judging others.

There exist other situations implicating a self-other distinction resulting in individuals devaluing the view of others yet showed hindsight bias in doing so. Using the Clinton impeachment case as it unfolded, Bryant and Guilbault (2002) looked at perspective-taking involving judgments for oneself, followed by the average American and their best friend. Participants showed hindsight bias for acquittal for their self-predictions, but it was not present in their predictions for the average American or best friend. Similarly, Hom and Kaiser (2016) asked participants to make foreseeability and ethical judgments for an animal experiment for themselves and then a peer. Participants who knew the outcome claimed the experiment was more foreseeable and ethical and later judged the peer to be less foresightful and ethical than themselves.

Further research devaluing the views of another is seen in legal cases, particularly in medical malpractice cases (e.g., Harley, 2007). For example, LaBine and LaBine (1996) had participants review a hypothetical case in which a psychiatric patient became violent, or they did not know the outcome. Knowing the outcome led participants to perceive the therapist's actions to be more foreseeable and less reasonable.

Other reactions altering the nature of egocentrism is present in situations involving self-relevant negative outcomes, namely ego-changing behavior that is defensive or reflecting retroactive pessimism. In the former, people will attempt to minimize their responsibility for the negative outcome as being unforeseeable in hindsight (Louie et al., 2000; Mark et al., 2003). If the negative outcome is foreseeable, then one is expected to act differently. Louie et al. (2000) had MBA students compete in a graded marketing study. Initially, participants made their predictions about a firm's market

performance from either a self or other perspective. Later, participants received a positive or negative outcome of the firm's market performance. Louie et al. (2000) found that hindsight bias occurred when the participants' own team succeeded but not when other teams succeeded. The bias was not observed when their team failed but was present in their judgments about the other teams' failure. Similarly, Mark et al. (2003) using a stock trading game's study found that students who received a negative outcome perceived it to be less foreseeable in competition with other students or neutral observers.

Instead of foreseeability, Tykocinski et al. (2002), in their retroactive pessimism approach argue that believing the outcome to be inevitable achieves the goal of reducing one's culpability. In one experiment, participants could lose a large stipend for being late. Participants in hindsight viewed being late to be more inevitable than in foresight and this difference did not occur in their judgments for a friend.

In short, egocentrism and its role in perspective-taking can be subject to the attributes of the situation. The presence of situations involving blame and responsibility apparently trigger the alternation of shared perspective-taking in participants to include ego enhancing and protective mechanisms. What is lacking in this research literature is a clearer picture of a self-other distinction whereby one's perspective-taking is shared or not shared. Past research aimed at singular judgments of others or consecutive judgments involving self and then others does not account fully for the contribution of one's own perspective-taking in adopting the perspective of others. In the former, there is no assessment of one's own judgment and in the latter, the multiple judgments confound an appropriate estimate of others' judgement without an appropriate baseline comparison.

Rationale for the Present Study

In his review, Nickerson (1999) pointed out the importance of anchoring and adjustment (Tversky & Kahneman, 1974) in people's egocentric judgments about others. Anchoring and adjustment effects can account for hindsight bias in self or other judgments using hypothetical or memory designs. Whether one is in the self or other's perspective, the outcome information (hindsight) provides pertinent information to the person. People typically respond by adjusting their judgments in the direction of the outcome to sync with their current outcome knowledge. In contrast, individuals in foresight do not have obvious anchoring of the outcome information. In the latter, individuals make their original predictions about an outcome, anchor on the outcome's receipt, and adjust their recall predictions in the outcome direction. This notion applies to situations involving self followed by judgments about others as well. Having people judge themselves and then others anchored one's attention to their own

knowledge in predicting for others. They can adjust their estimate based on the available information about the target or the situation itself.

In the absence of pertinent information, the person falls prey to seeing others much like themselves. Prior research (Tullis, 2018) shows that shying away from one's perspective is effortful and time-consuming that necessitates purposeful thinking. People resort to their own perspective when distracted, have little incentive to change, and under time constraints.

For this investigation, the foreseeability-inevitability component model of Blank and Peters (2010) is utilized. Foreseeability refers to being able to predict the outcome as reflected in "I knew-it-all-along." It is subjectively based on one's past knowledge that can be susceptible to meta-cognitive inputs like familiarity and surprise. The information makes the outcome seem more predictable in hindsight than foresight. Inevitability refers to one's certainty that is based on the situation and more objective, "It had to happen that way." These 2 components can be independent of one another. For example, tornadoes in different regions are inevitable but not predictable. Unlike the bulk of hindsight bias research, the model encompasses both foreseeability and inevitability judgments that can show differences in these evaluations. Also, it allows for an examination of the self-other distinction across situations that foster egocentrism and its possible ego-changing characteristics of a defensive nature.

Participants should exhibit the traditional hindsight bias in their initial self-judgments when placed in foresight and hindsight conditions. The answers in hindsight participants should be seen to be predictable, certain, and less surprising compared to the foresight participants. When faced with making judgments for the peer, participants should rely on their own perspective for their subsequent foresight and hindsight judgments regarding the peer (e.g., Epley et al., 2004). In the problem-solving situation employed in the present research, participants' egocentrism should not be altered by the activation of egocentric biases such as devaluing or ego defenses like unforeseeable and retroactive pessimism from the peer perspective. There should be no difference in participants' predictions of hindsight bias in making self-peer estimates. Such an outcome is also consistent with the commonality of hindsight knowledge in judgments of others in that people think that others share one's own perspective.

As noted earlier, a clear demonstration of egocentrism showing the sharing of one's perspective with others was not possible (Fischhoff, 1975; Harley et al., 2004). This difficulty was overcome by the appropriate change in methodology by Son et al. (2021) to reveal that hindsight bias was the same from the self or peer perspective. Initially, participants made self-judgments from a naïve state, gained reorganization of the distorted stimulus, and then tested again from a

self or peer perspective. In both instances, participants are faced with remembering their earlier recognition point in making another self or peer judgment and the resultant over-estimation effect is dependent on participants' initial self-judgments. From an anchoring and adjustment viewpoint, their participants anchored on their initial self-judgment and the resulting adjustment was not altered by the change in perspective-taking.

Prior to Son's et al. (2021) publication, the current research was completed in 2019 with the same focus on the self to peer perspectives. Between the two studies there exist differences in methodology, domain (problem-solving) and dependent measures (foreseeability-inevitability). The goal of the current research was to examine for the presence of egocentrism and hindsight bias in participants' initial self judgments via the hypothetical method and whether it carried over to their subsequent judgments from the peer perspective.

Also, the hypothetical method clearly demonstrates the influence of the correct answers on participants' judgments in their initial and subsequent judgments moving from a self to peer perspective. As a result of the earlier research showing the commonality of hindsight knowledge (Bernstein et al., 2018; Birch et al., 2017; Higham et al., 2017; Hoch & Loewenstein, 1989; Wood, 1978) and the better basis for decision-making by participants (Bradfield & Wells, 2005), it is conceivable that any changes that occur in shifting from the self to peer to a peer perspective will be observed principally in participants knowing the answers compared to those who do not know the answers.

Like the research design of Son et al. (2021), participants are likely to anchor spontaneously on their own initial perspective due to its accessibility in adjusting to the peer perspective. Because of the repeated exposure to the testing stimuli involved in the self-peer comparison, it is important to employ an adequate baseline comparison condition for the self to peer perspectives.

To address the issue of egocentrism in perspective-taking for hindsight bias, the task of solving anagrams was employed. Anagrams are scrambled letters which unscramble to produce a meaningful word. Solutions to anagrams involve problem-solving skills of an "aha" nature. The solution occurs rapidly and participants in hindsight find the answers obvious and less difficult (Hom & Ciaramitaro, 2001). These features are also present in perceptual forms of hindsight bias involving vision and audition. Though the task is simpler than the decision-making involved in forecasting stock markets, weather, and the coronavirus pandemic, it shares many aspects of the same uncertainty for those predicting the correct answer.

Via the hypothetical method, participants were tested in two phases. In phase 1, participants were required to make self-estimates from a foresight (naïve) or hindsight

(non-naïve) condition with or without being told to ignore the correct answers when making self-predictions and then for a peer. Ignoring the correct answers has been a key feature of much hindsight bias research to show the robustness of the effect (Roese & Vohs, 2012). To allow for a self-versus peer comparison, included was a condition where participants made their predictions for a peer but not themselves. Next, in phase 2, all participants were asked to make their judgments for the peer. This procedure allowed a self-peer repeated measure comparison for the foresight and hindsight conditions and the condition involving the repeated estimates for the peer. Multiple dependent measures typically used in hindsight bias research were employed in this study (e.g., surprise) to examine the hindsight bias in participants' predictions for themselves and their judgments about how a peer would answer.

Earlier, Bradfield and Wells (2005) showed that participants who possessed outcome knowledge believed they had a superior basis for their decision-making and greater skills in understanding others. If so, participants in hindsight should believe their peer's predictions are more accurate or realistic than participants in the foresight condition. This aspect is assessed by the same dependent measures employed to examine hindsight bias.

Finally, to examine participants' hurdles in understanding the peer's way of thinking, they were asked to evaluate their difficulty and confidence in judging themselves and the peer. Participants should find it more difficult and be less confident to access or estimate their knowledge of the peer because their own knowledge and beliefs are more readily accessible.

Method

Sample

A total of 193 participants were recruited from Introductory Psychology classes and tested in three large group settings at a public university. Participants were tested and given two research participation credits following the APA ethical guideline after receiving their informed consent. Of the 193 participants, five were excluded from the research for failing to answer all questions. Based on multivariate and univariate analyses ($\pm 3 SD$) for outliers, five more participants did not receive consideration. The sample was comprised mostly of US citizens (99.5%), Caucasians (84.1%), more females (67.8%) than males, with an overall average age of 21.98 years ($SD = 6.29$).

Design

This study involved the hypothetical method of investigating hindsight bias consisting of a 4 (foresight/three hindsight conditions) \times 2 (male/female) \times 2 (self-peer judgment) factorial design with repeated measures for the third factor. Proportionally balanced for gender, participants were randomly assigned to either the foresight or hindsight condition with the sample size varying from 44 to 48 participants for each condition. A problem-solving task (5-letter anagrams) was employed for this experiment.

For each condition, participants read information about the nature of predictions. They read those predictions are often based on their experience and can be a guess to make plans. Next, they read several examples including that the task dealt with solving moderately difficult anagrams (e.g., feukl-fluke) that are mixed-up letters that can be solved to produce a meaningful word (rpty-party), and the ability to solve them involved cognitive flexibility and intelligence. Finally, participants needed to imagine they had 10 s to solve each of the five anagrams. Then, they received a 10-s period to remind them of this time span. Also, participants were reminded to make their judgments quickly to complete testing.

In phase 1 of the foresight condition (F), naïve participants did not see anagrams with the correct answers and were asked to make their self-predictions for the correct answers. However, participants in the hindsight condition were not naïve as they saw anagrams with the correct answers. The hindsight condition was further varied with participants ignoring (HI, e.g., "what would you have predicted before knowing the answers") or not ignoring (HNI) the answers as they made their self-predictions. Also, rather than focusing on their self-predictions, participants in another hindsight condition made perspective judgments for a peer by the name of Matthew at the university. He was someone they did not know and the same age as the participant. Participants were asked to ignore the answers as they made their peer predictions (HPI) and to imagine that he had the same experience as themselves.

During phase 2, participants who made self-predictions in phase 1 received their perspective-taking instructions directed at the peer and made their predictions for the same anagrams used in phase 1. In contrast, participants who had rendered their judgments for the peer in phase 1 were reminded of the perspective-taking instructions and asked to judge the anagrams again for phase 2. After completing phase 2, participants answered questions assessing hindsight bias. Next, they were queried about how accurate or realistic their predictions were for the peer, followed by difficulty and confident judgments for themselves and the peer.

Measures

Hindsight bias measures for self and peer predictions were assessed for each anagram (i.e., difficulty, obviousness, surprise, familiarity, and chance of solving anagrams) using a 7-point Likert scale. Difficulty, obviousness, and surprise were anchored by 1 = *very little* to 7 = *very much*; familiarity, 1 = *slightly seen, heard, or used* to 7 = *often seen, heard, used every day*; and chance of solving anagrams, 1 = *very low* to 7 = *very great*. These same questions were utilized to assess participants' assertions of the accuracy or realism about their predictions for the peer. The Likert scale of 1 = *very little* and 7 = *very much* was also employed for participants' judgments about their difficulty and confidence in self and peer's judgments. The measures of difficulty and surprise were reversed coded for the statistical analyses.

Results

An average score was computed across five anagrams for the dependent measures of obviousness, familiarity, chance of solving anagrams, surprise, and difficulty during phases 1 and 2 to examine for hindsight bias. Initially, the analyses included the gender factor, which only resulted in one main effect. Thus, the gender factor was excluded from subsequent analyses due to the unequal number of gender participants in the experiment with the lack of specific hypotheses regarding gender differences.

Based on the component view of hindsight bias (Blank et al., 2008), a composite measure of foreseeability was created using difficulty, obviousness, and familiarity with a single-item assessment of inevitability (chance) and surprise. Using a Cronbach's alpha of .60 as the minimum score, these analyses showed that the foreseeability composites were satisfactory for phases 1 ($\alpha = .70$) and 2 ($\alpha = .85$). For the accuracy or realistic composite, difficulty was eliminated that resulted in a satisfactory composite ($\alpha = .65$).

Visually, an examination of the means (See Table 1 for Means and Standard Deviations) for foreseeability, inevitability, and surprise showed the hindsight conditions of HI, HNI, and HPI clustered together separately from the F condition in phase 1 and 2. Each hindsight condition rose upward for foreseeability and inevitability, and surprise decreased across the phases.

Judgments for Self or the Peer: Phase 1

A one-way MANOVA entailing self-judgments for foreseeability, inevitability, and surprise in phase 1 for F, HI, HNI, and judgments of Matthew (HPI) yielded only the main effect of conditions, $F(9, 430.92) = 4.51, p < .001, \eta^2 = .07$. Significant univariate contributors to this effect were foreseeability, $F(3, 179) = 9.94, p < .001, \eta^2 = .14$; and surprise, $F(3, 179) = 3.74, p = .01, \eta^2 = .06$; but not inevitability ($p > .05$).

Initially, it was important to establish that the problem-solving situation resulted in hindsight bias for participants making judgments for themselves. Multiple comparisons relevant to the hypotheses were analyzed via Tukey's HSD with a significance level of $p < .05$. F participants were compared to their counterparts in the HI and HNI conditions. These comparisons showed hindsight bias with participants in both hindsight conditions deeming the anagram solutions to be more foreseeability ($ps < .001$). This outcome was supported further by the HI participants who found the solutions to be less surprising ($p = .008$) and to a lesser extent by the HNI comparison ($p = .090$) to their F counterparts.

Asking participants to ignore (HI) or not ignore (HNI) the answers to the anagrams did not yield any differences for foreseeability or surprise, $ps > .05$. Importantly, participants hindsight judgments for these measures aimed at the peer (HPI) were the same when compared to HI and HNI participants, $ps > .05$. The findings of foreseeability and surprise for phase 1 showed hindsight bias in participants' judgments for themselves and their expectations for the peer

Table 1 Means and Standard Deviations for Phases 1 and 2 for foresight or hindsight condition

Dependent measures.	Foreseeability		Surprise		Inevitability	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Phase 1						
Foresight Self	3.47	.92	4.32	1.35	3.85	1.35
Hindsight Self Ignore	4.26	.77	5.02	.97	4.35	1.16
Hindsight Self Not Ignore	4.12	.62	4.83	.79	4.22	1.16
Hindsight Peer Ignore	4.08	.61	4.74	.93	4.02	.82
Phase 2						
Foresight Peer	3.48	.92	3.82	1.27	3.80	1.26
Hindsight Peer Ignore	4.62	.99	5.17	.98	4.85	1.24
Hindsight Peer Not Ignore	4.40	.97	5.10	1.00	4.63	1.26
Hindsight Peer Ignore	4.35	.99	4.91	1.10	4.54	1.27

in hindsight were the same. Although inevitability was not a significant contributor to the main effect, the mean tendencies for the hindsight conditions followed the findings for foreseeability and inevitability.

Judgments for Self and the Peer: Phases 1 and 2

After making judgments for themselves or the peer in phase 1, participants assessed the anagrams again from the peer's perspective. The issue was participants' judgments for self or peer was altered by the focus on Matthew. A two-way MANOVA with conditions (F, HI, HNI, HPI) and the self-peer repeated measures as factors were conducted for foreseeability, surprise, and inevitability.

The multivariate analyses indicated a significant conditions effect for foreseeability, $F(3, 179) = 14.78, p < .001, \eta^2 = .20$; inevitability, $F(3, 179) = 4.69, p = .004, \eta^2 = .07$; and surprise, $F(3, 179) = 11.49, p < .001, \eta^2 = .16$. The latter was qualified by an interaction between conditions and the self-peer factor, $F(3, 179) = 4.51, p = .004, \eta^2 = .07$.

Examination of this interaction revealed the tendency of F participants to predict more surprise for the peer and less surprise for the HI, HNI, and HPI participants than themselves. These changes in the hindsight conditions also occurred for foreseeability and inevitability in the reverse order in that they increased their estimates for the peer. Unlike surprise, there was not a change tendency in the F condition for these measures.

Subsequently, the interactive effect negated the self-peer ratings across conditions for surprise ($p > .05$) but not foreseeability, $F(1, 179) = 12.02, p = .001, \eta^2 = .06$, and inevitability, $F(1, 179) = 14.07, p < .001, \eta^2 = .07$. Each hindsight condition shifted upward for foreseeability and inevitability, $ps < .05$, while foresight participants failed to change ($p > .05$). This change showed the consequence of participants making repeated judgments having knowledge of the answers in hindsight compared to the foresight participants without the answers.

Further examination of the conditions effect revealed the following results when comparing the F condition to each hindsight condition (HI, HNI) for signs that the hindsight bias observed in phase 1 carried over to participants' expectations for the peer (see Table 1 for Means and Standard

Deviations). F participants differed from each hindsight condition for foreseeability, ($ps < .001$), surprise ($ps < .001$), and inevitability ($p = .03$ or $.003$). Hindsight participants saw the anagram solutions to be more foreseeable, inevitable, and less surprising than their foresight counterparts over the self-peer phases. The findings for foreseeable and surprising were the same as in phase 1 for participants' self-judgments. The inclusion of inevitability shows the consistency of participants' judgments in these measures from the self to the peer perspective.

Including HPI in the analyzes revealed that the hindsight bias in participants' judgments for themselves in phase 1 was the same when the target became the peer. Except for inevitability, HI and HPI participants deemed the solutions to be more foreseeable ($ps = .001$) and less surprising ($ps = .001$) than F participants without a difference between HI and HPI, $ps > .05$. This same outcome was seen in inevitability except the difference between F and HI participants was marginal ($p = .08$). Hence, making multiple judgments in hindsight (HPI) or a single judgment following one's own judgment (HI) was the same.

Furthermore, participants' estimates did not differ among the conditions of HI, HNI and HPI, for foreseeability, inevitability, and surprise, $ps > .05$. Regardless of the self to peer perspective or making judgments again more than once for the peer, their responses for the peer did not differ significantly from their own. The hindsight changes that occurred for these measures with repeated judgments reflects the familiarity of processing the answers a second time.

Accuracy or Realism of Predictions about the Peer

The following issue dealt with how accurate or realistic was participants' judgments about the peer. A one-way MANOVA with conditions as the factor was conducted for the dependent measures. There was a significant main effect of conditions, $F(9, 430.92) = 4.13, p < .001, \eta^2 = .07$, with significant contributions from the factors of foreseeability, $F(3, 179) = 5.75, p = .001, \eta^2 = .09$; surprise, $F(3, 179) = 5.43, p = .001, \eta^2 = .08$; and inevitability, $F(3, 179) = 4.77, p = .003, \eta^2 = .07$.

Table 2 Means and Standard Deviations on accuracy/realism measures as a function of foresight or hindsight condition for the peer

Dependent measures	Foreseeability		Surprise		Inevitability	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Foresight Peer ^a	3.70	1.22	3.53	1.46	3.69	1.61
Hindsight Peer Ignore ^a	4.71	1.27	4.09	1.43	4.84	1.35
Hindsight Peer Not Ignore ^a	4.41	1.24	4.59	1.69	4.44	1.54
Hindsight Peer Ignore ^b	4.39	1.02	4.23	1.58	4.10	1.48

^aParticipants made judgment for phase 2 only. ^bParticipants made judgments for phases 1 and 2

No differences (see Table 2 for Means and Standard Deviations) were found when comparing participants' judgments among the hindsight perspectives (HNI, HI, HPI) for any of the dependent measures, $ps > .05$. For foreseeability, participants felt more accurate or realistic in their hindsight judgments in the HI ($p = .001$) and HNI ($p = .024$) conditions involving a single assessment or multiple assessments for the peer ($p = .030$) than from the foresight perspective. Unlike these outcomes for foreseeability, there was not the same consistency in the surprise and inevitability measures. For example, participants in the HNI ($p = .006$) and the HPI ($p = .002$) but not HI ($p > .05$) conditions believed they were more accurate or realistic in their surprise estimates than the foresight participants. For inevitability, the accuracy or realistic judgments were greater for HI ($p = .002$) than F participants but not when the latter comparison was to HNI and HPI ($ps > .05$).

Difficulty and Confidence in Predictions about the Peer

Finally, participants made difficult and confident judgments about themselves and the peer's predictions. A two-way MANOVA with all conditions and the self-peer factor repeated measures showed only a significant main effect for the repeated measures, $F(1, 179) = 75.63, p < .001, \eta^2 = .30$. Participants reported more difficulty in making predictions for the peer than for themselves (Self $M = 4.38, SD = 1.91$; Peer $M = 2.78, SD = 1.72$). Similarly, the only significant outcome for confidence was the self-peer factor, $F(1, 179) = 93.07, p < .001, \eta^2 = .34$. Participants felt more confident in making judgments for themselves than the peer (Self $M = 4.75, SD = 1.33$; Peer $M = 3.07, SD = 1.81$). In making these decisions, participants were less confident and found it more difficult to judge the peer.

Discussion

Participants exhibited egocentrism by perceiving the peer to essentially share the same hindsight perspective as themselves in problem-solving. In their initial judgments for themselves showing hindsight bias, participants judged the anagram solutions to be more predictable and less surprising than the foresight participants. Participants who made their initial judgments from a self-perspective when shifted to the peer perspective showed hindsight bias across the self-peer phases for foreseeability and surprise with the addition of inevitability. The inclusion of an appropriate baseline indicated that the hindsight bias observed in the self-perspective carried over to the peer-perspective. Ignoring (HI and HPI) or not ignoring (HNI) the answers in hindsight were inconsequential. Although post-hoc, individuals claimed their

predictions were more accurate or realistic for the peer in hindsight than foresight for foreseeability, yet it was more challenging to predict for the peer than themselves.

Consistent with Nickerson's (1999) supposition, participants in their self and/or peer judgments projected their estimations onto the peer by anchoring and adjusting on their own knowledge. Their hindsight determinations were similar for the comparison between themselves, and the peer and this effect was observed in their self to peer assessments. The correlations for each hindsight condition involving the measures of foreseeability, surprise, and inevitability were all significant (ps ranging from $< .000$ – $.029$) with rs ranging from $.62$ to $.33$. Furthermore, the projective determinations of participants dovetail with earlier research showing that knowledge in hindsight is common in the greater population in judgments of others (Birch et al., 2017; Hoch & Loewenstein, 1989; Wood, 1978).

Believing that the peer's hindsight bias is the same as for oneself and that outcome knowledge is widespread could be tied to participants' accuracy or realistic judgments about the peer. Participants indicated their foreseeability judgments were more accurate or realistic in hindsight than foresight suggesting that they understood the peer's way of responding with the following caveat. Roese and Vohs (2012) indicate that such a perception can falsely promote one's understanding of others to produce negative outcomes.

The present research builds on the earlier findings of Son's et al., (2021) research. One, it provides a replication showing egocentrism via the hypothetical method using a problem-solving task, and the dependent measures of foreseeability, inevitability, and surprise. Two, the findings shows that the expression of egocentrism and hindsight bias need not involve the multiple testing procedure of Son's et al. (2021) procedure comparing self-self to self-peer judgments. Signs of hindsight bias and egocentrism occurred in participants' initial judgments that was maintained in shifting to the peer perspective. Three, due to repeated testing, participants showed significant changes in the shifting of perspectives that did not alter the expression of egocentrism or hindsight bias. Four, showing further significance of knowing the answers in hindsight triggered participants' changes for foreseeability, inevitability, and surprise in the same fashion. Five, the answers in hindsight resulted in participants believing that their foreseeability predictions for the peer were more accurate or realistic. Six, it was more challenging in general to predict for the peer than themselves. Seven, the showing of egocentrism and hindsight bias in the current research involved different groups of participants rather than the occurrence of these events within the participants.

Common to Son's et al. (2021) and the current research, the situations did not involve responsibility and blame or self-relevant negative outcomes. The current research and Son's et al. (2021), experiment 1 lacked an incentive for

participants to question their evaluation to show egocentrism. However, in the latter for experiment 2, with the target being children, the expression of egocentrism was interrupted. Participants may use the same strategy for themselves and the peer because it is easy and effortless. To adjust a forecast by viewing the peer to be different, requires purposeful thinking. The work of Son et al. (2021) and the current findings, expands our understanding of how egocentrism and perspective-taking play out in hindsight bias.

Despite the proposed importance of the current findings, there exist possible limitations. The target for perspective-taking was an unfamiliar male, order effects of participants making judgments for themselves and then the peer, ecological validity of judging for a “hypothetical” peer instead of a real person and the interactive effect found for the surprise measure. Regarding ecological validity, Harley et al. (2004) reported the existence of hindsight bias in children when they recognized ambiguous pictures of objects from the perspective of “Ernie” from Sesame Street. Their research raises issues about broadening targets for perspective-taking to include non-human figures like dolls and avatars. The interactive effect for surprise indicated a tendency for all the hindsight conditions to exhibit less surprise in shifting to the peer-perspective, there was a tendency for greater surprise in the foresight participants. This tendency for the foresight participants was not present for the other measures of foreseeability-inevitability. While these latter measures are consistent with a cognitive account, it suggests the presence of a motivation to view the peer to be more surprised than themselves and that the alternation of one’s egocentrism is more susceptible to emotions.

The hindsight bias effect consistently occurs even when individuals are directed to ignore the outcome information as they make their predictions in hindsight (Roese & Vohs, 2012). In separate experiments, Fischhoff (1975) showed hindsight bias with or without the direction to ignore the outcome information. In the present research, asking participants to ignore or not ignore the correct answers to the anagrams failed to alter the expression of hindsight bias.

Much research has demonstrated that hindsight bias is exceedingly difficult to mitigate or to eliminate. Passive manipulations like warning again the bias (Fischhoff, 1975), to avoid the bias (Kamin & Rachlinski (1995), providing incentives for correct judgments (Hell et al., 1988) and forcing individuals to try harder (Fischhoff, 1975), fail to reduce the bias substantially. Generally, these outcomes indicate participants’ inability to ignore the correct answers in hindsight. In 2019, Dietvorst and Simonsohn proposed the novel idea that individuals choose to use the outcome information rather than to ignore it. This tendency can be overcome when there is sufficient justification to ignore the outcome. In one study, a majority of their 393 participants (73%) felt that the outcome information enabled them to make more accurate

judgements about the responses of others in the study. Such a result is consistent with participants believing that their foreseeability judgments were more accurate or realistic in hindsight than foresight. Given the time constraints in the present research, participants might choose to ignore the constraint to ignore the answers in making their judgments.

Implications and Practical Considerations

The present findings in a non-evaluative context lack questioning decision-making or the need to evaluate others’ capabilities. Unlike the former, the latter fuels an incentive for change and the use of intention and purposeful thinking that trumps one’s own perspective-taking. This difference also points to further investigating judgments for oneself and others in an evaluative context based on Blank’s et al. (Blank et al., 2008) component model of hindsight bias. The model can also accommodate positive and negative outcomes and provide an understanding of another’s puzzling behavior, such as President Trump’s comments on the pandemic crisis.

Because it is infeasible to test empirically, the crisis yielded numerous events subjected to speculative reasoning about his decision-making. An event like the pandemic has multiple causes, and it created a great deal of ambiguity for Americans. In their perspective-taking, President Trump and others may resort to mental shortcuts like hindsight bias (“bound to happen”) to reduce uncertainty to make sense of the unfolding events during the pandemic.

President Trump’s decision-making has raised two questions. One was President Trump’s handling of the pandemic crisis. Did he react too late to the magnitude of the pandemic? Two, was the ventilator shortage predictable? The former President Trump initially stated that the number of infections and deaths were quite low and minimized the disaster’s severity.

Perhaps, he chose this approach because he thought Americans would find it comforting. However, as the number of incidents increased exponentially (negative outcome), he seemed to react at times that it was unforeseeable (defensively) or inevitable (retroactive pessimism). In either instance, he denied responsibility and blame. Due to the current electorate’s bipartisan makeup, people may view the former President to be much like or different from themselves. Without the benefit of a foresight perspective, people in hindsight can overestimate the pandemic’s foreseeability while others may see it to have been inevitable. The former belief heightens responsibility and blame accusations, while the latter belief lowers it when directed at the former President.

This same speculative account is also applicable to Dale et al., (2020) reporting on the former President Trump’s statements about the ventilator shortage for the critically ill.

According to Dale et al. (2020), he disputed the claim about the shortage by saying that “nobody” could have predicted it and reinforced it later by “It takes a period to build them (ventilators), and again nobody could have known a thing like this could happen.”

Overall, the consideration of prior research utilizing self and peer judgments along with the two examples in evaluating President Trump identifies an important source of further research for perspective-taking effects and egocentrism. In the former, participants are making inferential judgments about Trump from their own perspective without a direct comparison to themselves. Such a comparison reveals whether hindsight bias (unforeseeable/inevitable) varies from themselves relative to Trump. Depending on the outcome, the results provide further nuances about Trump’s actions. The Trump examples without a direct comparison to self-judgments suggest that participants’ own perspective-taking was altered by their purposeful thinking.

Conclusion

Participants faced with adopting the peer’s perspective showed essentially the same hindsight bias as themselves. This result of sharing perspective-taking adds to previous research showing that individuals believe that their hindsight knowledge is commonly present in others. Cognitively, the saliency and accessibility of their own knowledge or what they think they knew, prompted judgments for themselves and a peer with the tendency to view their predictions for the latter to be more accurate. Extending the present research to include cognitive-motivational processes (e.g., blame) provides a richer account of perspective-taking in hindsight bias for problem-solving and other social behavior like stereotyping and prejudice.

Researchers like Dekker (2004) and Hedden (2019), and others have proposed ideas that are challenging the direction of hindsight bias research. Dekker (2004) questions whether hindsight bias is even a bias and Hedden (2019) argues that it is not necessarily an irrational process. Von der Beck et al. (2019) ask whether hindsight bias can even exist without the receipt of definite outcome knowledge by showing hindsight bias in people’s use of conjectures about the outcome. Dietvorst and Simonsohn (2019) question the assumption that people exhibit hindsight because they cannot ignore the outcome information. Oeberst et al. (2018) reveal sources of hindsight bias in the mass media and that even the reading of a biased article generates hindsight bias in a reader. Most recently, Meuer et al. (2021) showed that hindsight bias conditions the way we write. Based on the research of Son et al. (2021) to debias hindsight bias via perspective-taking, and the present investigation, researchers should not overlook

perspective-taking effects in hindsight bias as much social interaction embraces reasoning about another person.

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Data Availability The dataset is available from the corresponding author on request.

Declarations

Conflict of Interest There is no conflict of interest in this research. American Psychological Association ethical guidelines including informed consent and the Institutional Review Board approval from the University were followed in conducting this research.

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